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| 10/759,971 | 01/15/2004 | Klaus Hartig | 44046.203.143.22 | 8328 |

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| EXAMINER |
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PIZIALI, ANDREW T

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| ART UNIT | PAPER NUMBER |
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1771

DATE MAILED: 01/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|-------------------------------|-------------------------------|--|
| Office Action Summary | Application No. 10/759,971 | Applicant(s) HARTIG ET AL. | |
| | Examiner Andrew T. Piziali | Art Unit 1771 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 November 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>11/28/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The amendment filed on 11/18/2005 has been entered. The examiner has withdrawn the objection to the drawing based on the newly submitted drawing. The examiner has withdrawn the objections to the specification based on the amendments to the specification. The examiner has withdrawn the objection to claim 9 based on the amendment to claim 9.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-7, 9-17 and 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,090,481 to Depauw et al. (hereinafter referred to as Depauw).

Regarding claims 1-7, 9-17 and 19-23, Depauw discloses a coating carried by a substrate having a surface comprising from the substrate surface outwardly an inner dielectric layer, a first infrared reflective layer, an intermediate dielectric layer, a second infrared reflective layer, and an outer dielectric layer (column 3, lines 26-39). Depauw discloses that each dielectric layer can be a composite layer formed of successive subsidiary layers of different compositions from each other (column 5, lines 31-40 and Table A). Depauw discloses that the dielectric materials include zinc oxide, tin oxide, and silicon nitride (column 5, lines 23-30). Depauw discloses that the physical thickness of each layer of a composite layer may be no more than about 250Å (Table A). Therefore, Depauw discloses a coating carried by a substrate comprising an

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intermediate dielectric stack comprising zinc oxide/silicon nitride/zinc oxide/silicon nitride/zinc oxide.

Depauw does not mention a specific embodiment wherein each of the layers of the first dielectric have an optical thickness greater than the optical thickness of any of the layers of the second dielectric, but DePauw does disclose that a variety of layer thickness combinations may be utilized (see Table A). Depauw does not specifically mention the claimed thickness construction, but modifying the thickness construction would have been obvious at the time of applicant's invention because the use of preferred materials and the optimum or workable ranges discovered by routine experimentation is ordinarily within the skill of the art. Further, it would have been obvious to modify the thickness construction because the applicant has not disclosed that having the specific thickness construction solves any stated problem or is for any particular purpose (see the paragraph bridging pages 10 and 11). Therefore, considering that the current applicant fails to teach or suggest unexpected results relating to the claimed thickness limitation, and considering that the applicant discloses that if desired all the layers of the invention may actually have the same thickness (see the paragraph bridging pages 10 and 11), it would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the thicknesses of the layers, such as currently claimed, because it is understood by one of ordinary skill in the art that layer thicknesses determine properties such as transmittance, reflectance, emissivity, and color and because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

Regarding claims 7, 17 and 20, Depauw discloses that the layers are preferably applied by sputtering (column 5, lines 60-61). The applicants disclose in the specification that zinc oxide

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is a polycrystalline material when applied in thin films via sputtering (see specification page 12, lines 17-18). The applicants also disclose that thin layers of silicon nitride can be thought of as substantially amorphous even after tempering (see specification page 12, lines 22-23).

Therefore, it appears that the zinc oxide layers of Depauw are polycrystalline and the silicon nitride layers of Depauw are amorphous.

Regarding claims 22 and 23, Depauw discloses that the dielectric materials include a combination of zinc oxide and tin oxide (column 5, lines 23-30).

Regarding claim 23, Depauw discloses that the second infrared reflective layer may be contiguous to the fifth intermediate dielectric layer (see Examples 1-10).

4. Claims 8 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,090,481 to Depauw as applied to claims 1-7, 9-17 and 19-23 above, and further in view of USPN 5,837,361 to Glaser et al. (hereinafter referred to as Glaser).

Depauw discloses that a sacrificial metal layer, such as a titanium layer, may be disposed above each infrared reflective silver layer (column 5, lines 11-12 and lines 46-54), but DePauw does not specifically mention a layer of niobium. Glaser discloses that titanium and niobium are known sacrificial metal layers (column 3, lines 49-61). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the sacrificial metal layer from any suitable sacrificial metal, such as niobium, as taught by Glaser, because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability.

Response to Arguments

5. Applicant's arguments filed 11/18/2005 have been fully considered but they are not persuasive.

Depauw does not mention a specific embodiment wherein each of the layers of the first dielectric have an optical thickness greater than the optical thickness of any of the layers of the second dielectric, but DePauw does disclose that a variety of layer thickness combinations may be utilized (see Table A). Depauw does not specifically mention the claimed high/low/high/low/high intermediate dielectric stack thickness construction, but considering that the current applicant fails to teach or suggest unexpected results relating to the claimed thickness construction, and considering that the applicant discloses that if desired all the layers of the invention may actually have the same thickness (see the paragraph bridging pages 10 and 11), it would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the thicknesses of the layers, such as currently claimed, because it is understood by one of ordinary skill in the art that layer thicknesses determine properties such as transmittance, reflectance, emissivity, and color and because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

It is noted that the selection of film thicknesses to achieve optical features and properties of a glass coated article can be readily determined empirically by those skilled in the art or, for example, by employing a commercially available optics prediction software program. Typically, a graphic presentation of the optical properties of a given glazing article, sorted by individual layer thickness and refractive index, can be used to determine the regions of optimum film stack

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design (see USPN 5,248,545 to Proscia (1993), including the paragraph bridging columns 6 and 7).

The applicant asserts that Depauw does not teach any advantage that can be achieved, or any problem that can be solved, by selecting particular relative thicknesses for the intermediate dielectric layers of the coating. The applicant suggests that the current specification teaches or suggests that an advantage that can be achieved, or a problem can be solved, by selecting particular relative thicknesses for the intermediate dielectric layers of the coating. The examiner respectfully disagrees. The current specification does not teach any advantage that can be achieved, or any problem that can be solved, by selecting particular relative thicknesses for the intermediate dielectric layers of the coating. Rather, the current specification discloses that all of the intermediate dielectric layers may have the same thickness (see page 10, lines 21-22). The current specification also discloses that “one useful intermediate film stack of the invention” comprises a low/medium/high/medium/low thickness construction (see page 9, lines 18-22). This thickness construction is identical to one of the constructions utilized by Depauw (see Example 6).

The applicant also asserts that the particular relative thicknesses exhibit unexpected results. The applicant asserts that by limiting the thickness of the second and fourth intermediate dielectric layers the “stress, absorption, etc.” would be limited. The current specification is silent regarding the stress, absorption, etc. effects of limiting the thickness of the second and fourth intermediate dielectric layers. As stated above, the current specification actually teaches away from the existence of unexpected results by teaching that the intermediate dielectric layers may have the same thickness or a low/medium/high/medium/low thickness construction.

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The applicant also asserts that there is no motivation to alternate oxide and nitride layers within the intermediate dielectric stack. The examiner respectfully disagrees, but applicant's argument is moot because Depauw discloses that the intermediate dielectric oxide (SnO, ZnO, or Zn₂SnO₄) layers may be alternated with the intermediate dielectric nitride (Si₃N₄) layers (column 5, lines 23-45).

The applicant also asserts that unexpected results are associated with the use of alternating oxide and nitride layers within the intermediate dielectric stack. Again, applicant's argument is moot because Depauw discloses that the intermediate dielectric oxide (SnO, ZnO, or Zn₂SnO₄) layers may be alternated with the intermediate dielectric nitride (Si₃N₄) layers (column 5, lines 23-45).

Conclusion

6. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T. Piziali whose telephone number is (571) 272-1541. The examiner can normally be reached on Monday-Friday (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (571) 272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

atp

g-B 12/16/05
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